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Twentieth Anniversary
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P-335.5

May 23, 1997

Box PATENT APPLICATION
Commissioner of Patents
and Trademarks
Washington, D.C. 20231

Express Mail

RE: Patent Application of Thomas Gipson for "Improved
Method and Apparatus for Injection of Tubing Into
Wells"

Gentlemen:

Enclosed please find the following documents in support of Thomas Gipson's Application for Patent on
"Improved Method and Apparatus for Injection of Tubing Into Wells":

1. New Application Transmittal
2. Title Page for Specimen
3. Specimen--Background, Claims and Abstract
4. Six (6) sheets of drawings (figures)
5. Combined Declaration and Power of Attorney
6. Assignment, Assignment Cover Sheet
7. Verified Statement - Small Business
8. Verified Statement - Independent Inventor
9. Check for filing fee and assignment fee - \$425.00
10. Acknowledgement Postcard

Sincerely,

THOMAS E. SISSON

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Enclosures

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COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

NEW APPLICATION TRANSMITTAL

Transmitted herewith for filing is the new patent application of

Inventor: Thomas C. Gipson

For: IMPROVED METHOD AND APPARATUS FOR INJECTION
OF TUBING INTO WELLS

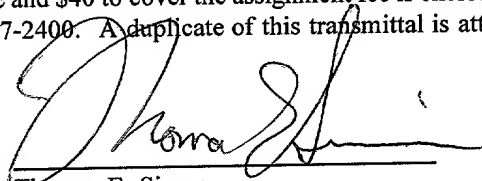
Enclosed are:

- [X] 18 Pages of specification, claims and abstract.
[X] 6 Sheets of drawings.
[X] An Assignment (with cover sheet) of the invention to Fleet Cementers, Inc.
[X] Verified statement to establish small entity status under 37 CFR 1.9.
[X] Verified statement to establish small entity status under 37 CFR 1.27.
[X] Declaration and Power of Attorney For Patent Application.
[X] Acknowledgment postcard.

The filing fee has been calculated as shown below:

			Small Entity		Other Than A Small Entity	
	Number Filed	Number Extra	Rate	Fee	Rate	Fee
Basic Fee				385.		770.
Total Claims	11-20=	0	X11.		X22.	
Indep. Claims	3- 3=	0	X40.		X80.	
Multiple Dependent Claim			130.		260.	
Total				385.		

- [X] A check in the amount of \$385 to cover the filing fee and \$40 to cover the assignment fee is enclosed. Any deficiency in fees should be charged to Account #07-2400. A duplicate of this transmittal is attached.



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Wanda T. Dake
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Veria T. Sark

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

**TITLE: IMPROVED METHOD AND APPARATUS
 FOR INJECTION OF TUBING INTO WELLS**

INVENTOR: Thomas C. GIPSON

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The present invention relates to an improved coiled tubing injector. More particularly, the present invention relates to a coiled tubing injector mounted on a mobile frame with means for an adjustable, quick change of a storage reel or spool, means for varying the holding pressure of coiled tubing against the injection reel, and means for angular injection of coiled tubing into a wellhead.

The general background relating to coiled tubing injector units is described in the inventor's previous U.S. Pat. No. 4,673,035 which is incorporated herein by reference for all purposes.

It has been found that by increasing the degree of wrap of the coiled tubing around the injector reel and by being able to adjust the amount of pressure applied against the tubing at various locations around the wrap, injection of the tubing into the wellhead is improved. Greater depths of injection may be achieved much more quickly.

Further, there has been a need to accommodate various widths and diameters of tubing storage spools. Considerable time and effort are expended in the removal and replacement of a spent storage spool. By providing a means to quickly change the spool and to adjust for a different spool width or diameter (diameter being generally understood as flange height of a spool), the present invention increases productivity and reduces the cost of operation.

1 Angular or horizontal well drilling has become an
2 increasingly important feature in oil and gas production as
3 well as in environmental remediation procedures. There has
4 developed a need to be able to inject extensive runs of coiled
5 tubing (1000-2000 feet) into shallow, horizontal wellbores.
6 However, it has been difficult to inject coiled tubing through
7 the sharp bend of a shallow, horizontal well. The present
8 invention enables the operator to angularly inject coiled
9 tubing into such a wellhead. The increased wrap of the coiled
10 tubing around the injector reel with the capability of being
11 able to adjust the pressure on the wrapped tubing provided by
12 the present invention further improves the ability of the
13 operator to inject coiled tubing into a shallow, horizontal
14 wellbore.

15 SUMMARY OF THE INVENTION

16 The improvements in coiled tubing injection provided by
17 the present invention are achieved by a unique arrangement of
18 structural elements. A mobile frame accommodates a cradle
19 which supports a coiled tubing storage spool. The cradle may
20 be provided with a traversing mechanism which allows the
21 storage spool to slidably reciprocate across the frame during
22 the return of coiled tubing to the spool to distribute the
23 tubing evenly on the storage spool. The cradle has a pair of
24 opposed pivotable bullnose arms which engage openings in the
25 spool side wall or flange and allow the spool to rotate. The

1 arms are slidably adjustable both horizontally and vertically
2 to accept spools of varying widths and diameters within the
3 same cradle. A mast is pivotably attached to the frame to
4 raise and lower an injector reel rotatably mounted on an
5 opposite end of the boom arm from a first stored position to
6 a second tubing injection position. A drive mechanism is
7 attached to the injector reel to rotate the injector reel to
8 dispense or retrieve the coiled tubing. The injecting
9 position results in the injector reel being generally
10 positioned to inject the coiled tubing into a well or hole in
11 the earth's surface. The injecting position may be vertical
12 or generally 90° to the earth's surface or it may be angled at
13 less than 90° to facilitate injection into a shallow
14 horizontal well depending upon the embodiment utilized. A
15 separate drive is provided for the storage spool to cooperate
16 with the injector reel in injecting or retrieving the coiled
17 tubing. A hold down assembly is mounted around a portion of
18 the circumference of the injector reel for exerting pressure
19 against the coiled tubing over more than 90° of injector reel
20 circumference. The hold down assembly has a multiplicity of
21 individual hold down mechanisms which enable the operator to
22 vary the pressure exerted on the coiled tubing at any location
23 around the circumference of the reel where there is positive
24 engagement of the tubing with the rollers of the assembly.
25 The apparatus is provided with coiled tubing straighteners;

1 one of the straighteners in the angular injection mode is
2 housed within the mobile frame and the other is attached above
3 the wellbore.

4 BRIEF DESCRIPTION OF THE DRAWINGS

5 The invention will be better understood and objects other
6 than those set forth above will become apparent when
7 consideration is given to the following detailed description
8 of the preferred embodiments. Such description makes
9 reference to the annexed drawings wherein:

10 Fig. 1 is a side elevation view of the tubing injector
11 apparatus constructed according to the teachings of the
12 present invention. The injector reel is positioned in the
13 stored position.

14 Fig. 2 is a top view of the injector apparatus of Fig. 1.

15 Fig. 3 is a back end view of the apparatus of Fig. 1.

16 Fig. 4 illustrates the bullnose arms of the present
17 invention in the retracted position to accept a storage spool.

18 Fig. 4A illustrates a standard storage spool of the prior
19 art.

20 Fig. 5 shows a side elevation view of the apparatus
21 constructed according to the teaching of the present invention
22 in a first alternative injecting position.

23 Fig. 6 is a back end view of the apparatus of Fig. 5.

24 Fig. 7 is a side elevation view of an alternative
25 embodiment of the apparatus of the present invention in the

1 stored position.

2 Fig. 8 is a back end view of the apparatus of Fig. 7.

3 Fig. 9 illustrates a side elevation view of an
4 alternative embodiment of the apparatus of the present
5 invention in the angular injection position.

6 Fig. 10 is a back end view of the apparatus of Fig. 9.

7 Fig. 11 is an illustration of a side elevation view of
8 the storage spool cradle of the present invention with a small
9 diameter spool shown in broken lines.

10 Fig. 12 shows a side elevation view of the storage spool
11 cradle of the present invention with the side frames raised to
12 support a large diameter spool shown in broken lines.

13 Fig. 13 is an end view of the storage spool cradle with
14 the bullnose arms in the inserted position for a wide spool.

15 Fig. 14 is an end view of the storage spool cradle with
16 the bullnose arms in the inserted position for a narrow width
17 spool.

18 Fig. 15 is an end view of the storage spool cradle with
19 the bullnose arms in the retract position for a wide spool.

20 Fig. 16 is a section view of one of the hold down
21 mechanisms constructed according to the teachings of the
22 present invention.

23 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

24 It should be understood by one of ordinary skill in the
25 art that much of the basic operation of the present inventive

1 coiled tubing injection apparatus is detailed in U.S. Pat. No.
2 4,673,035 which is incorporated herein by reference for all
3 purposes. The instant description emphasizes the improvements
4 to the present apparatus over U.S. Pat. No. 4,673,035.

5 Referring to Fig. 1, there is shown a preferred
6 embodiment of the present invention indicated generally at
7 reference 10. In the embodiment shown in Fig. 1, the
8 apparatus 10 is mounted on a trailer but could be mounted to
9 a truck (not shown) or on a separate frame (not shown) which
10 could be slid or lifted onto or off of a truck or trailer. As
11 shown in Fig. 1, the apparatus 10 is mounted on a mobile frame
12 having wheels 14 and a control cabin 16.

13 A coiled tubing storage reel or spool 18 is mounted on a
14 cradle 20, and coiled tubing 22 is stored thereon. The cradle
15 20 is attached to a traversing mechanism (not shown) as
16 described in U.S. Pat. No. 4,673,035, which allows the cradle
17 20 to be reciprocated perpendicularly to the axis of the frame
18 12. Spool side frames or supports 24 are slidably affixed to
19 the cradle 20 by telescoping connections 25 and 27 so that the
20 opposed bullnose assemblies 26 may be moved closer together or
21 further apart depending upon the width of the particular
22 storage spool being used (see Figs. 13 and 14). Spool side
23 supports 24 and the corresponding bullnose assemblies 26 may
24 be pivoted outwardly as shown in Fig. 15 to retract the
25 bullnose assemblies from the storage spool. Hydraulic

1 cylinders 30 are utilized to urge the supports 24 outward
2 about pivot joints 28.

3 Fig. 4 illustrates the quick placement of a storage reel
4 or spool 18, by rigging the spool to spreader bar 32 with
5 chain 33. The bullnose assemblies 26 are pivotally retracted
6 to enable the spool to be removed or installed.

7 Turning again to Fig. 1, injector reel 34 is shown in the
8 stored position at the front end 36 of the frame 12. Reel 34
9 is rotatably attached to one end of boom arm or mast 38. Mast
10 38 is attached at hinge member 40 to mast riser 42. Mast
11 riser 42 is attached to the back end 44 of frame 12.

12 Injector reel 34 is further provided with a drive
13 mechanism 46 which includes a hydraulic drive motor 48, a
14 drive chain linkage 50, and sprocket assembly 52 extending
15 circumferentially around the injector reel 34.

16 Reel support frame 190 also extends circumferentially
17 around the reel 34 and supports the straightener assembly 54
18 and the hold down assembly 56. Hold-down assembly 56 consists
19 of a multiplicity of separate hold down mechanism 58. In the
20 preferred embodiment twenty hold-down mechanisms are mounted
21 around a portion of the circumference of the injector reel 34
22 to exert pressure against the coiled tubing over more than 90°
23 of the injector reel circumference. Fig. 5 illustrates the
24 degree of wrap that is provided by the hold-down assembly 56
25 when the injector reel 34 is in the tubing injection position.

1 Also shown in Fig. 1 is the hydraulically activated
2 elevating work floor 58, leveling cylinders 60, swing lock 62,
3 mast lift cylinder 64, and storage spool drive mechanism 66.

4 Fig. 2 illustrates a top view of the apparatus 10 with
5 the storage spool 18 and cradle 20 centered on the frame 12
6 traverse mechanism. The injector reel 34 is in the stored
7 position at the front end of the frame. Fig. 3 is a partial
8 back end view of the apparatus 10 with a bullnose assembly 26
9 inserted into the storage spool 18. A lateral positioning
10 cylinder 68 is shown attached beneath the frame 12 to provide
11 support and stabilization on uneven terrain.

12 Fig. 5 shows the mast 38 raised by mast lift cylinder 64
13 to a tubing injection position generally perpendicular to the
14 frame 12 and at the back end 44 of the frame 12. Swing locks
15 62 (one on each side of mast 38) have been latched to secure
16 the mast 38 and injector reel 34 in the uplift position. It
17 should be noted that in the injecting position coiled tubing
18 22 extends from the storage spool 18 up and over the injector
19 reel 34 wrapping the injector reel at an angle or arc greater
20 than 90°.

21 Hold-down assembly 56 extends around a portion of the
22 circumference of the injector reel more than 90° to exert
23 pressure on the coiled tubing as it is injected into the well
24 or returned to the spool. Tubing 22 exits the apparatus 10
25 generally perpendicularly to the earth's surface as seen in
26 Fig. 5. Angle A_v is generally 90° in when the embodiment of

1 Fig. 5 is in the injecting position. Further, Fig. 5
2 illustrates that the support frame 24 supporting the bullnose
3 assemblies 26 may be telescopingly vertically raised or
4 lowered to accommodate various storage spool diameters. In
5 Fig. 5 the frame 24 is shown vertically raised to accept a
6 large diameter spool.

7 The standard spool configuration may be seen in Fig. 4A.
8 The spool diameter is also called the flange height and is
9 designated A. The spool core diameter is shown as B while the
10 spool inside width is designated C and the spool outside width
11 designated D. The present invention 10 will accommodate a
12 spool having a diameter A from 90" to 165" and having spool
13 widths D from 58" to 96".

14 A telescoping tubing stabilizer 70 has an upper section
15 71 and a lower section 72 as seen in Fig. 5. The stabilizer
16 70 extends from the straightener assembly 54 to the B.O.P 74
17 at the wellhead. The function of the stabilizer 70 is to
18 ensure that the coiled tubing 22 does not bend or excessively
19 flex as it is being injected.

20 A partial back end view of the injection apparatus 10 is
21 illustrated in Fig. 6. As may be seen the apparatus is in the
22 raised injecting position with the injector reel 34 above the
23 storage spool 18 and frame 12 and generally perpendicular to
24 the earth's surface 80. The storage spool 18 has been
25 traversed to the right on the frame 12 and the cradle 20

1 extended to support the spool 18. The reel support frame 190
2 is shown supporting one of the hold-down mechanisms 58.

3 An alternative embodiment of the present inventive
4 apparatus 11 is shown in Figs. 7 through 10. In embodiment 11
5 the frame 12 is mounted on the back of a truck 15. The
6 injector reel is attached to the frame 12 in front of the
7 storage spool 18.

8 A pivoting hinge 90 connects an upper frame section 82 to
9 lower frame section 84. A telescoping mast or boom arm 38 is
10 pivotally attached to a front end of the lower frame section
11 84 and the front end of the upper frame section 82. When the
12 mast is activated the front end of the upper frame section 82
13 is raised bringing the injector reel 34 above the lower frame
14 section 84 and the storage spool 18 as seen in Fig. 9.

15 Coiled tubing 22 is directed from the storage spool 18
16 around the injector reel 34. Both the spool 18 and the reel
17 34 are provided with drive mechanisms 66 and 46, respectively,
18 to cause each to rotate to push or pull the coiled tubing 22
19 into or out of the well as desired.

20 Because of the unique placement and arrangement of the
21 spool 18, the injection reel 34, the mast 38, and the hinge
22 90, coiled tubing 22 may be angularly injected into a well or
23 hole in the earth's surface 80. Fig. 9 shows the apparatus 11
24 in the injecting position with the coiled tubing 22 exiting
25 the apparatus 11 at an angle A_v of less than 90° to the earth's
26 surface.

1 An additional feature shown in Figs. 7 and 9 and provided
2 in embodiment 11 is that the straightener assembly 54 and the
3 stabilizer tube 70 are housed within the upper frame section
4 82 thereby saving considerable space and assembly time. A
5 second straightener assembly may be attached to the distal end
6 92 of the stabilizer tube above the well or hole.

7 Figs. 8 and 10 illustrate partial back end views of the
8 alternative embodiment 11. Fig. 8 shows one bullnose assembly
9 26 retracted and the other inserted. Fig. 10 shows the cradle
10 20 traversed to the right to its maximum extent.

11 As previously discussed cradle 20 is provided with
12 supports 24 which are adjustable both vertically and
13 horizontally to accommodate various widths and diameters of
14 storage spools. Figs. 11 and 15 illustrate these features of
15 the present invention. Fig. 11 shows a storage spool 18
16 slidably attached to cradle 20. Support 24 which supports the
17 bullnose 26 is provided with a hydraulic lifting cylinder 100.
18 Fig. 11 shows cylinder 100 in the retract or lowered position.
19 This position allows the operator to insert and remove a
20 smaller diameter spool. A spool drive mechanism 66 includes
21 a hydraulic motor 69, a drive chain or belt 65 and spool drive
22 sprocket 67. An adjustable idler 61 is provided to enable the
23 operator to vary the length of the drive mechanism to
24 accommodate various diameter spools as may be required. Fig.
25 12 illustrates the cylinder 100 in the extended or raised
26 position to accommodate a larger diameter spool.

1 The horizontal adjustment of the cradle 20 to accommodate
2 varying spool widths is illustrated in Figs. 13-15. Fig. 13
3 shows the supports 24 in the extended or wide position.
4 Sliding connections 25 and 27 allow the supports 24 and
5 bullnose assemblies 26 to be moved apart. Fig. 14 illustrates
6 the supports in the narrow position. Finally, Fig. 15
7 illustrates the bullnose assemblies 26 in the outwardly
8 pivoted retract position and the supports in the extended
9 position.

10 The unique hold-down mechanism 58 of the present
11 invention is shown in Fig. 16. As previously discussed, in
12 the preferred embodiment twenty of the mechanisms 58 are
13 positioned around a portion of the circumference of the
14 injector reel. Each mechanism is provided with a spindle
15 bracket 200, a spindle 202, a roller 204, and a pressure or
16 tension adjustment bolt 206.

17 The mechanism is attached to the reel frame 190 as shown
18 in Fig. 16. By adjusting bolt 206 the roller 204 may be
19 raised or lowered against the coiled tubing 22 which rides in
20 groove 210 of roller 204. Bearings 208 and 210 are affixed to
21 the spindle 202 to allow the roller 204 to rotate. Dust caps
22 212 and 214 may be provided to protect and seal the bearings.

23 By individually adjusting the pressure of the mechanism
24 58 against the coiled tubing the operator has greater control
25 over the injection and retraction process.

1 Although the invention has been described with reference
2 to a specific embodiment, this description is not meant to be
3 construed in a limiting sense. On the contrary, various
4 modifications of the disclosed embodiments will become
5 apparent to those skilled in the art upon reference to the
6 description of the invention. It is therefore contemplated
7 that the appended claims will cover such modifications, alter-
8 natives, and equivalents that fall within the true spirit and
9 scope of the invention.

1 CLAIMS:

- 2 ✓1. An apparatus for injecting coiled tubing into a hole in
3 the earth's surface comprising:
4 a frame having a front end and a back end;
5 a tubing storage spool removably mounted on said frame
6 at said back end and having said coiled tubing
7 stored thereon;
8 a mast pivotally mounted on said frame;
9 an injector reel rotatably mounted on said mast, said
10 injector reel pivotable from a first stored
11 position at said front end to a second tubing
12 injecting position;
13 a drive mechanism attached to said injector reel to
14 rotate said injector reel; and
15 a hold down assembly mounted around a portion of the
16 circumference of said injector reel for exerting a
17 pressure against said coiled tubing over more than
18 90° of said injector reel when said injector reel is
19 in said second operative position and said coiled
20 tubing is directed between said hold down assembly
21 and said circumference of said injector reel to
22 provide positive engagement of said tubing by said
23 injector reel when said injector reel is being
24 rotated to pull said tubing off of said tubing
25 storage spool or return said tubing to said tubing
26 storage spool.

1 2. The apparatus of claim 1 wherein said hold down assembly
2 further comprises a bracket attached to said circumference of
3 said injector reel, said bracket having an adjustment member
4 for varying the pressure of a roller against said coiled
5 tubing.

6 3. The apparatus of claim 1 wherein said second tubing
7 injecting portion positions said injector reel above said back
8 end of said frame, said mast extending generally perpendicular
9 to said frame, and said coiled tubing exiting said apparatus
10 generally perpendicularly to said surface.

11 4. The apparatus of claim 1 wherein said second tubing
12 injecting position positions said injector reel above said
13 front end of said frame, and said coiled tubing exits said
14 apparatus at an angle less than 90° to said surface.

15 5. The apparatus of claim 1 further comprising a first
16 tubing stabilizer assembly mounted within said frame and a
17 second tubing stabilizer mounted above said hole in said
18 surface.

19 6. The apparatus of claim 1 wherein said tubing storage
20 spool is further removably mounted to an adjustable cradle
21 frame having opposed pivotable bullnose arms.

22 7. The apparatus of claim 1 wherein said opposed pivotable
23 bullnose arms are horizontally slidably attached to said
24 cradle frame to accept a range of storage spool widths.

1 8. The apparatus of claim 1 wherein said opposed pivotable
2 bullnose arms are vertically slidably attached to said cradle
3 frame to accept a range of storage spool diameters.

4 9. The apparatus of claim 1 wherein said drive mechanism is
5 of adjustable length to accommodate a range of storage spool
6 diameters.

7 ✓10. An apparatus for injecting coiled tubing into the earth's
8 surface comprising:

9 a frame having a front end and a back end;

10 a tubing storage reel removably mounted on said frame

11 and having coiled tubing stored thereon;

12 an injector reel rotatably mounted on said frame;

13 a mast pivotally mounted on said frame;

14 a drive mechanism attached to said injector reel to
15 rotate said injector reel;

16 a multiplicity hold down mechanism mounted around a
17 portion of the circumference of said injector reel
18 for exerting a variable pressure against said
19 coiled tubing when said coiled tubing is directed
20 between said hold down assembly and said
21 circumference of said injector reel to provide
22 positive engagement of said tubing by said injector
23 reel when said injector reel is being rotated to
24 pull said tubing off of said tubing storage reel or
25 return said tubing to said tubing storage reel,
26 each of said hold down assembly further comprising:

1 a bracket attached to said circumference of said
2 injector reel, said bracket having an
3 adjustment member for varying the pressure of
4 a roller against said coiled tubing; and
5 a tubing straightener mechanism attached to said
6 injector reel.

7 /11. A method of retrieving a length of coiled tubing and
8 storing said tubing on a tubing storage spool comprising:

9 rotating a reel;

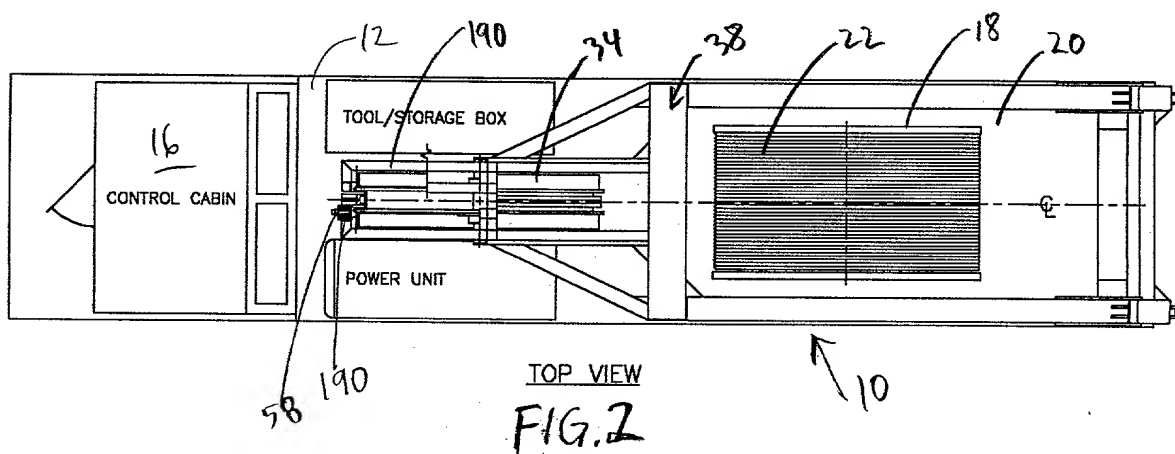
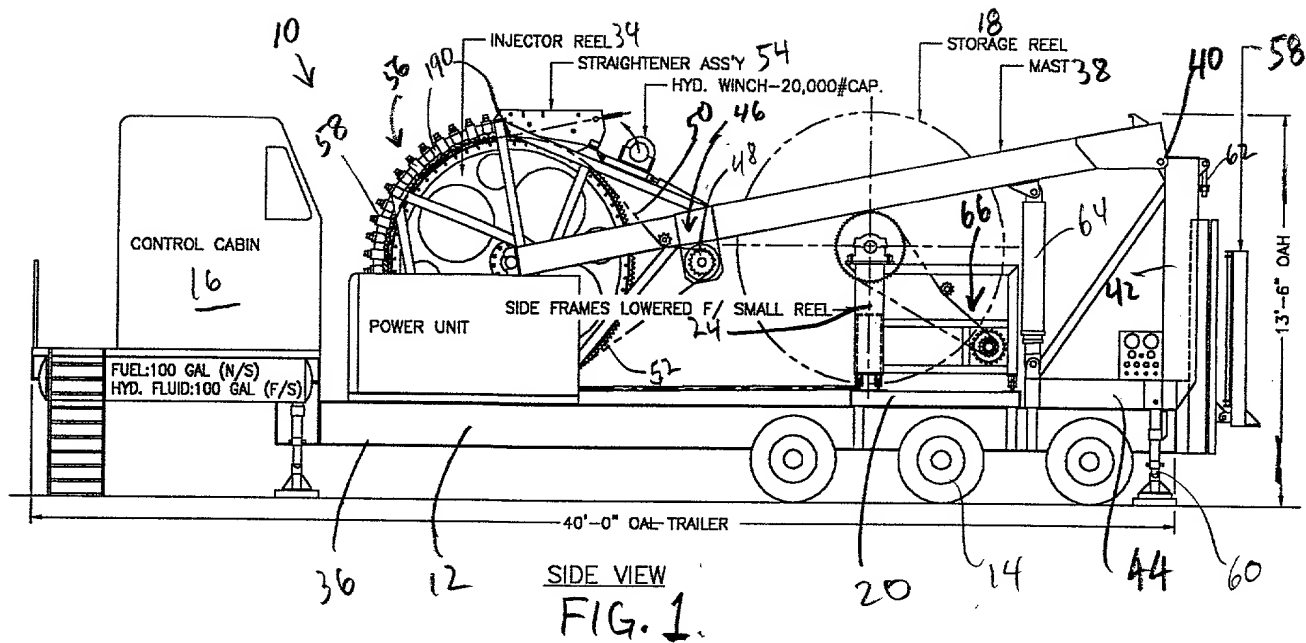
10 exerting pressure against more than 90° of the
11 circumference of said reel while running said
12 tubing around a portion of said circumference
13 to exert pressure against said tubing to cause
14 positive engagement of said tubing by said
15 reel; and

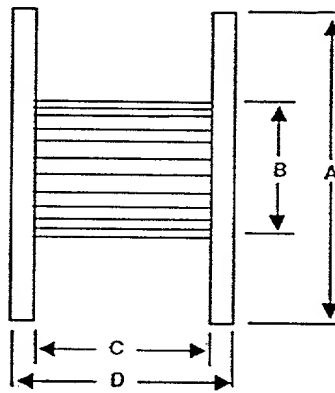
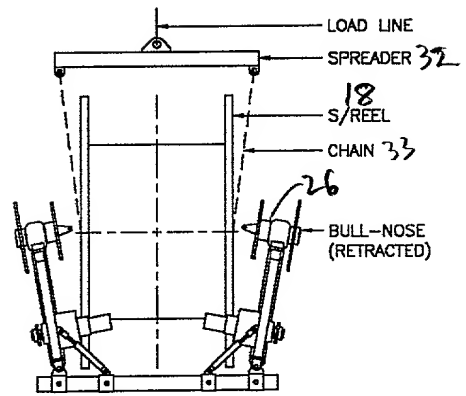
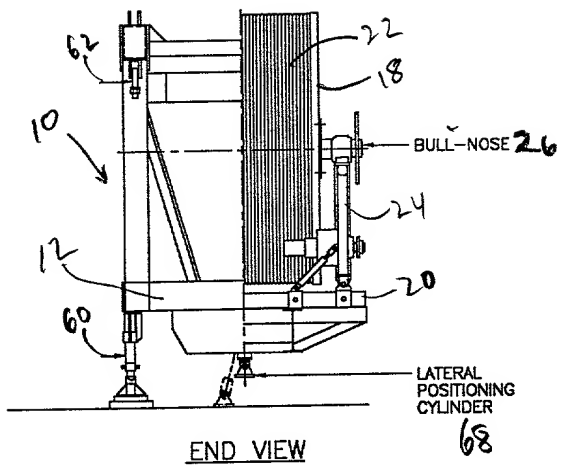
16 routing said tubing off of said reel onto said
17 tubing storage spool, said tubing storage
18 spool mounted on a cradle vertically and
19 horizontally adjustable to accept varying
20 spool widths and diameters.

ABSTRACT OF THE DISCLOSURE

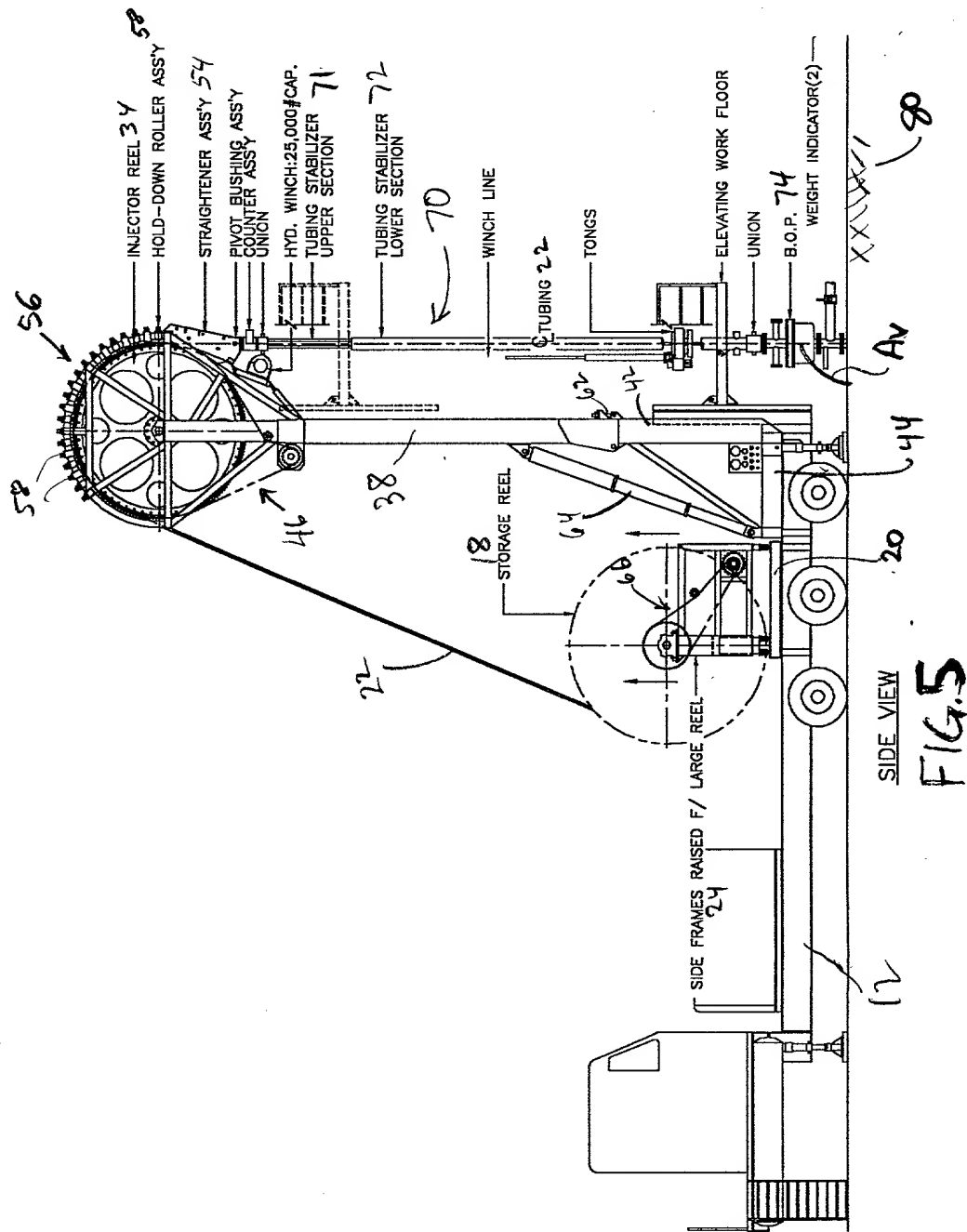
An improved apparatus and method for injecting and retrieving a length of coiled tubing and storing the tubing on a storage spool. An injector reel is pivotally mounted on a frame such that coiled tubing may be angularly injected to shallow, horizontal wells. A hold-down assembly is provided to individually adjust the pressure applied to the coiled tubing as it is injected into or retrieved from a well. The positioning of the injector reel and the storage spool in the injecting mode ensures a greater degree of wrapping of the coiled tubing around the injector reel to improve the control of the injection and retraction of the tubing. A vertically and horizontally adjustable storage spool cradle enables the operator to vary the width and diameter of the storage spools used in the apparatus.

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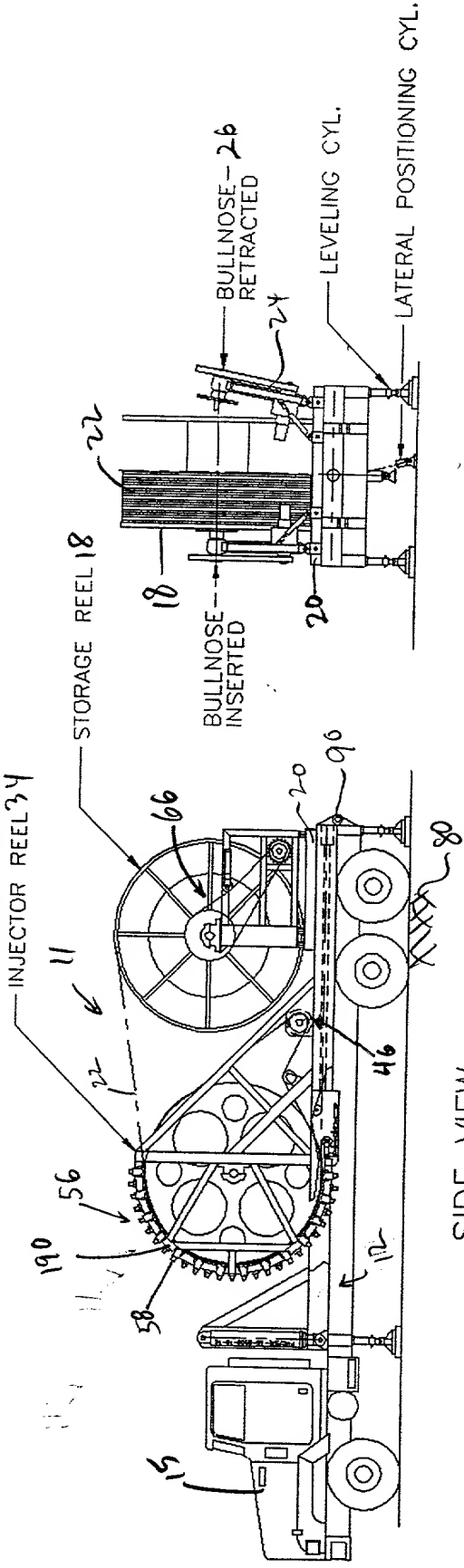




(PRIOR ART)



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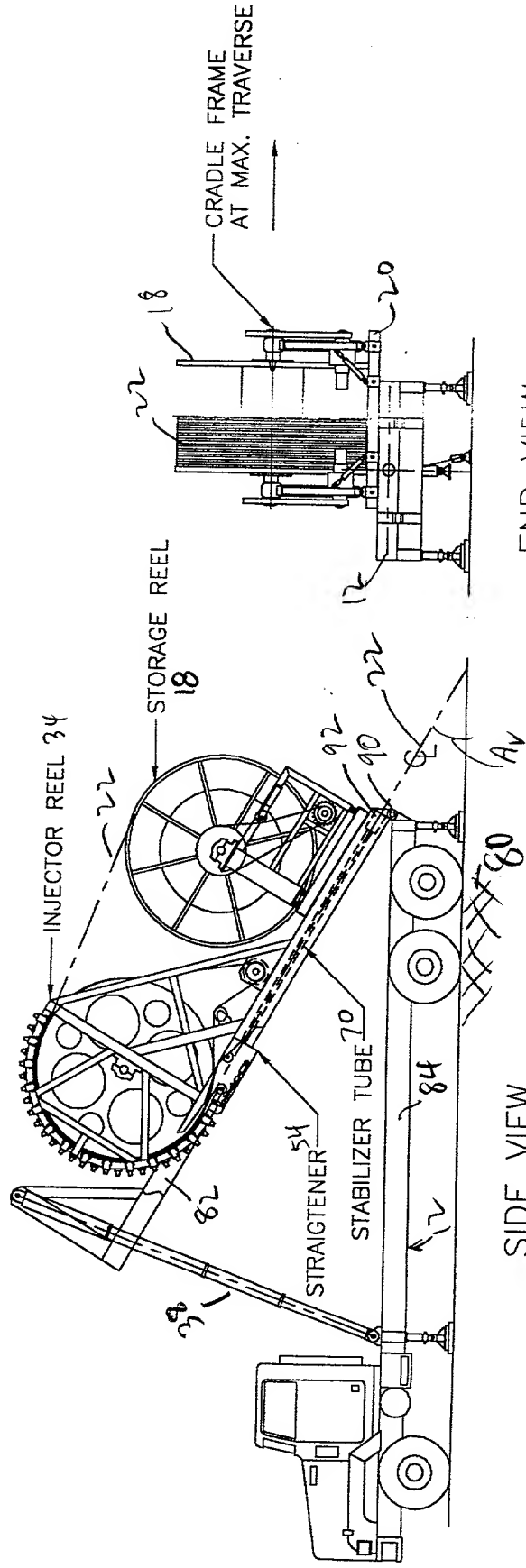


SIDE VIEW

FIG. 7

END VIEW

FIG. 8



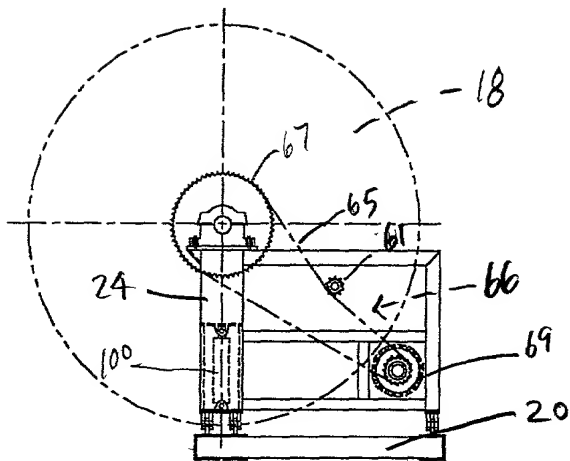
SIDE VIEW

FIG. 9

END VIEW

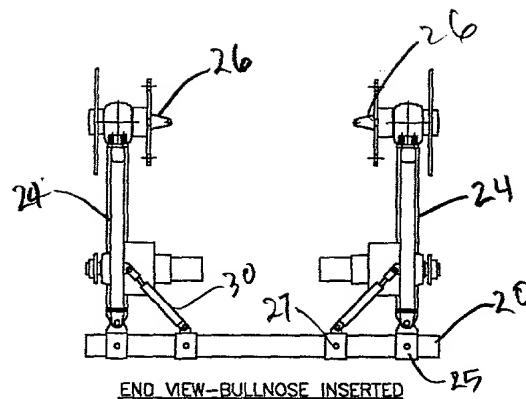
FIG. 10

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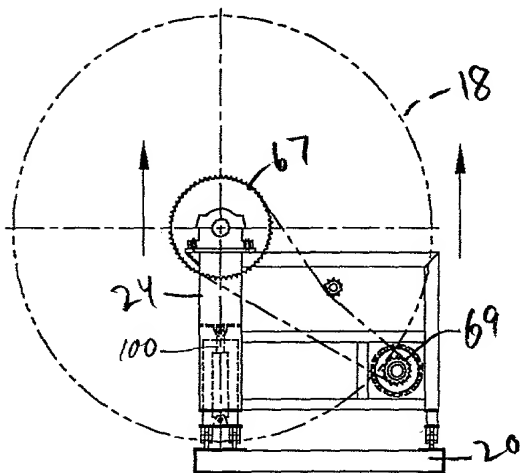
SIDE VIEW-SIDE FRAMES LOWERED F/ SMALL REEL

FIG 11



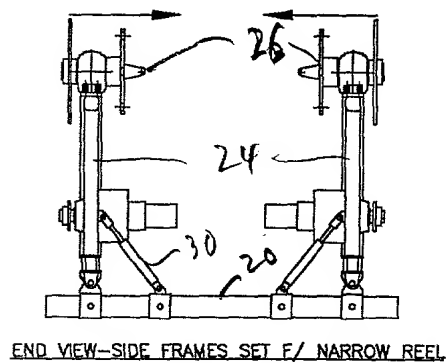
END VIEW-BULLNOSE INSERTED

FIG.13



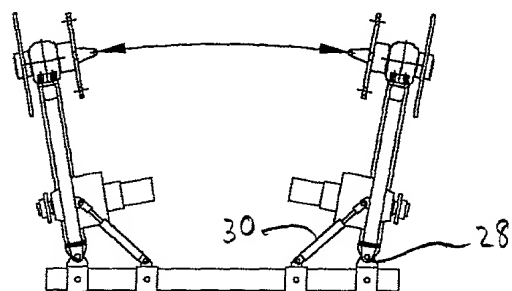
SIDE VIEW-SIDE FRAMES RAISED F/ LARGE REEL

FIG 12



END VIEW-SIDE FRAMES SET F/ NARROW REEL

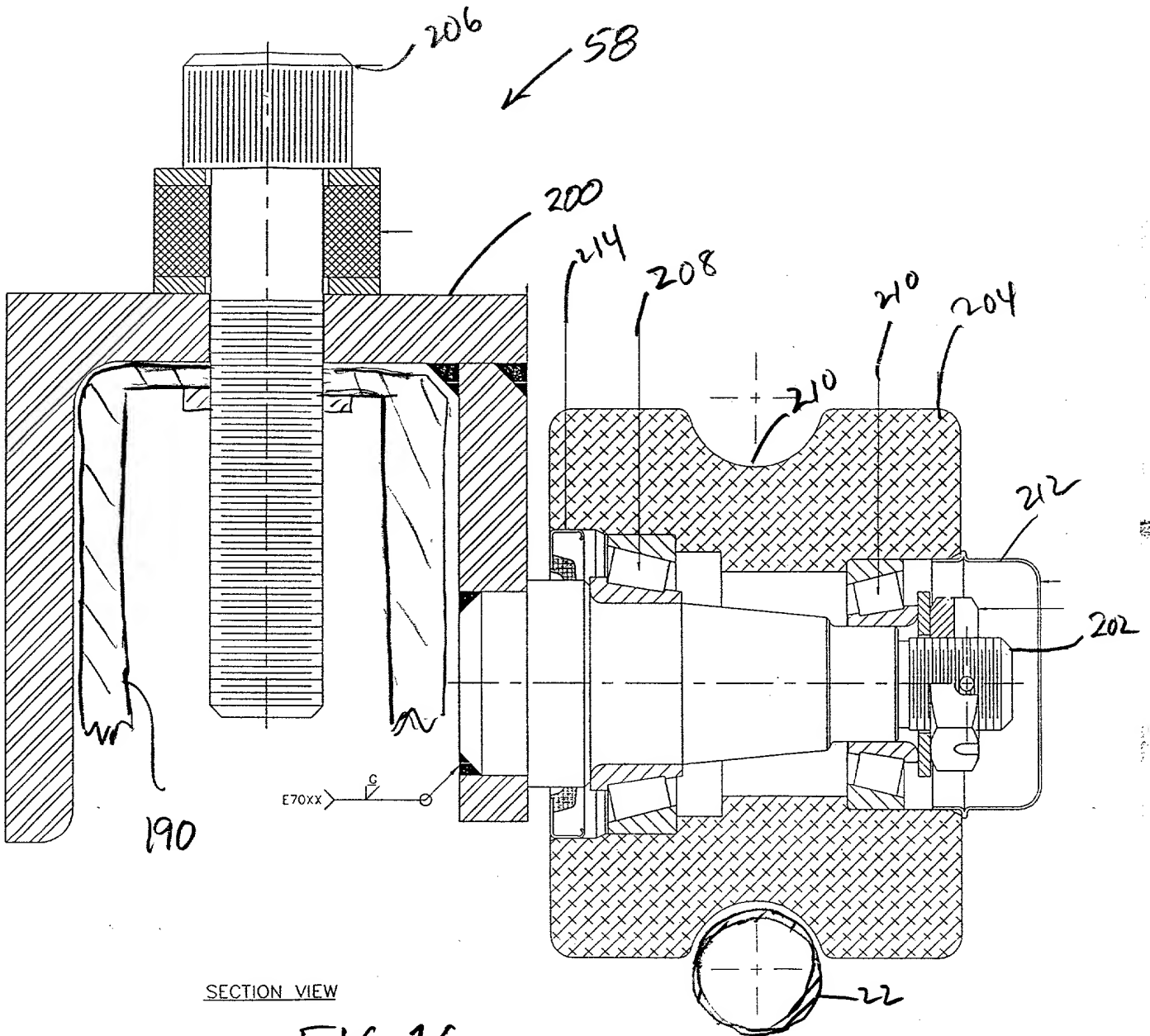
FIG.14



END VIEW-BULLNOSE RETRACTED

FIG15

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SECTION VIEW

FIG. 16

COMBINED DECLARATION AND POWER OF ATTORNEY

As a below-named inventor, I hereby declare that:

This is an original patent application.

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled IMPROVED METHOD AND APPARATUS FOR INJECTION OF TUBING INTO WELLS, the specification of which is attached hereto.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge my duty to disclose information which is material to the examination and patentability of this application in accordance with Title 37, Code of Federal Regulations, §1.56.

At this time I do not claim foreign priority benefits under 35 USC §119.

POWER OF ATTORNEY

I hereby appoint the following attorneys to prosecute this application and transact all business in the Patent and Trademark Office connected therewith:

Thomas E. Sisson, Reg. #29,348;
Mark H. Miller, Reg. #29,197;
William B. Nash, Reg. #33,743;
Pamela Huff, Reg. #35,901;

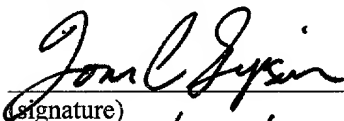
Ted D. Lee, Reg. #25,189;
Daniel D. Chapman, Reg. #32,726;
Mark Kammer, Reg. #34,197;
Mark V. Muller, Reg. #37,509.

Direct all correspondence and telephone calls to:

Thomas E. Sisson
Gunn, Lee & Miller, P.C.
300 Convent, Suite 1650
San Antonio, Texas 78205
(210) 222-2336

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Thomas C. Gipson

 , Inventor
(signature)

Date: 5/23/97

Residence: Cisco, Texas 76437

Citizenship: United States

Post Office Address: P. O. Box 231, 1-20 East, Cisco, Texas 76437

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Applicant: Thomas C. Gipson

For: IMPROVED METHOD AND APPARATUS FOR
INJECTION OF TUBING INTO WELLS

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY
STATUS (37 CFR 1.9(f) and 1.27(b)) - INDEPENDENT INVENTOR

As the below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code, to the Patent and Trademark Office with regard to the invention entitled IMPROVED METHOD AND APPARATUS FOR INJECTION OF TUBING INTO WELLS, described in the specification filed herewith.

I have not assigned, granted, conveyed or licensed and am under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b)).

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

Thomas C. Gipson



Signature, Inventor

Date: 5/23/92

Applicants: Thomas C. Gipson

For: IMPROVED METHOD AND APPARATUS FOR INJECTION OF TUBING
INTO WELLS

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY
STATUS (37 CFR 1.9(f) and 1.27(c))-SMALL BUSINESS CONCERN

I hereby declare that I am an official of the small business concern empowered to act on behalf of the concern identified below:

Fleet Cementers, Inc.
P. O. Box 231
I-20 East
Cisco, Texas 76437

I hereby declare that the above identified small business concern qualifies as a small business concern as defined in 13 CFR 121.3-18, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third-party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed, to and remain with the small business concern identified above with regard to the invention entitled IMPROVED METHOD AND APPARATUS FOR INJECTION OF TUBING INTO WELLS, by inventor Thomas C. Gipson, described in the specification filed herewith.

If the rights held by the above identified business concern are not exclusive, each individual, concern or organization having rights to the invention is listed below and no rights to the invention are held by any person, other than the inventor, who could not qualify as a small business concern under 37 CFR 1.9(d) or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

N/A

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
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FLEET CEMENTERS, INC.
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Pres.

Date: 5/23/87